# PATENT SPECIFICATION 756,531

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COMPLETE SPECIFICATION

## Folding rigid roofs for motor road vehicles

I, HERMANN FLEMMING, a German citizen of Torwang bei Rosenhei, Oberbayern, Germany, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to folding rigid roofs for the bodies of motor road vehicles and is concerned with motor cars and the like of the type having seats (including a driver's seat) in a row at the front of the vehicle behind which is an accommodation space in which there may, if desired, be more seats.

For the sake of clarity, throughout the following description and claims, the seats first mentioned above will hereinafter be referred to as "front seats", but it is to be understood that the use of such term is not meant to infer that there are necessarily any additional seats, the word front serving to indicate that the seats concerned are positioned towards the front of the vehicle. Moreover, the term "seats" is intended to include a single structural entity such as is sometimes known as a "bench seat" which will accommodate a number of seated passengers as well as a number of separate seats each intended to accommodate a single passenger.

Roof constructions are known which permit the conversion of a closed vehicle to an open vehicle and *vice versa* without the use of flexible materials such as leather or canvas, and in such constructions the whole roof structure is generally capable of being swung backwards and downwards from its "closed" position (i.e. where it provides a closed roof for the vehicle) to an open position wherein it is clear of the accommodation space behind the front seats of the vehicle.

If seats are provided in the accommodation space and these are not required to accommodate passengers, it is undesirable that the accommodation space should be left open, since it merely collects dust and serves as a wind trap. Moreover, the accommodation space cannot safely be employed for the storage of articles, e.g. parcels, coats or travelling accessories, as these would not be secured against theft when the vehicle is parked.

The prior known constructions also have the disadvantage that they necessitate deviations from standard practice, so far as the construction of the car body is concerned, involving, for example, omission of side windows corresponding to the accommodation space at the rear of the front seat; omission of a luggage space from behind the seats in the accommodation space when these are provided; reduction in the accessibility to the interior of the vehicle boot, if such is provided; and variation of or deviation from the streamlined form of the vehicle.

An object of the present invention is to provide a construction which avoids the above-mentioned disadvantages and which combines the advantages of a rigid roof (e.g. weather resistance, long life and simple operation) with those of a folding roof which can be opened to a first "open" position wherein the front seats are open but the accommodation space therebehind is closed or to a second "open" position wherein both the front seats and the accommodation space are uncovered. With the roof in the first open position, the accommodation space provides a secure, weatherproof luggage and clothing receptacle.

With this in view, the present invention provides a rigid roof for a motor road vehicle of the type described comprising a plurality of sections, a rear section of which is pivotally or foldably connected to the rear of the vehicle body, the remaining sections being pivotally or foldably connected to the body or to the rear section so that they can be lowered to a first position wherein they close the accommodation space behind the front seats of the vehicle

[*Price*

and lie with their front edge in contact with or close to the backs of the front seats, or to a second position clear of the accommodation space.

Where seats are provided in the accommodation space the vehicle can be used with only the front seats open or with all the seats open, or with the roof completely enclosing the whole car, i.e. as a saloon.

The invention will be described further, by way of example, with reference to the accompanying drawings in which:—

Fig. 1 is a diagrammatic side elevation of a motor car incorporating one embodiment of roof according to the invention,

Fig. 2 is a side view corresponding to Fig. 1 but showing the roof lowered to its first open position,

Fig. 3 is a view similar to Fig. 1 but showing a second embodiment of roof according to the invention,

Fig. 4 is a side view corresponding to Fig. 3 but showing the roof lowered to its first open position,

Fig. 5 is a view similar to Fig. 1 but on an enlarged scale of a third embodiment of the invention, and

Fig. 6 is a side view corresponding to Fig. 5 but showing the roof lowered to its first open position.

Similar reference numerals have been used for similar parts in all the figures.

Referring to Figs. 1 and 2, the vehicle comprises a body *a* having a front seating space *b*, an accommodation space *c* behind the front seats, and a luggage boot *d* accessible through a door *e* in known manner. Mounted on the body *a* are a windscreen *f* and side windows *g*. A rigid roof of the vehicle, shown generally by the reference numeral *h*, comprises a front section *i* and a rear section *k*, the front section *i* being secured to the rear section *k* in such a manner that it can be pushed, pivoted or otherwise be brought to a position *i'* (see Fig. 1) immediately above the front part of the rear section *k*. The front section *i* is therefore capable of being opened somewhat after the manner of a sliding roof.

The rear section *k* is formed with two depending side parts *l* and a rear wall *m* which is pivoted thereto and capable of being swung to the position *m'* of Fig. 1, and is connected to the rear of the vehicle body *a* by links *n* so that the whole roof can be lowered backwards over the rear of the body to the position illustrated in Fig. 2 at *h'*.

Such lowering can be effected without previously moving the front section *i* to the position *i'*, so that the section *i* extends across and closes the accommodation space *c*. This constitutes the first "open" position of the roof.

If, however, the front section *i* is brought to the position *i'* as shown in dotted lines in Fig. 2, the accommodation space behind the front seats of the vehicle is open and the seats therein can be used. This constitutes the second open position of the roof. The pivoting of the rear wall *m* to the position *m'* ensures that the luggage boot *d* is always accessible.

The embodiment of the invention illustrated in Figs. 3 and 4 is very similar to that of Figs. 1 and 2 but in this instance the parts *l* of the rear section *k* are accommodated inside the rear part of the vehicle body *a* instead of outside as in the preceding example. Additionally, the rear wall *m*, instead of being pivotally secured to the rear section *k*, is pivoted to the rear of the body *a*, and a pair of parallel links *p*, *q* are provided on the rear section *k* so that a parallel movement of the section is obtained on lowering. A similar movement can be obtained by use of single links in combination with a sliding or rolling guide.

Referring now to Figs. 5 and 6, in this embodiment of the invention the vehicle roof *h* comprises a front section *i*, an intermediate section *r* and a rear section *s* which includes the side wall and is equivalent to the parts *l* and a rear wall equivalent to the part *m* described in the preceding example. The intermediate section *r* is hinged to the rear section *s* at 1, and the rear section *s* is linked at 2 to the rear of the vehicle body *a* and can pivot thereabout in a clockwise direction as viewed in Fig. 5 to the position shown in dotted lines in Fig. 6 wherein it is disposed in the rear part of the body and the intermediate section *r* has been drawn backwards to a position thereabove. A flap *x* on the rear of the body *a* is capable of being swung down to the position *x'* of Fig. 6 to permit the pivoting of the rear section *s*. A lever and rod connection may be provided between the flap *x* and the pivot 2 so that the flap moves automatically with the roof.

Window pillars *t* are pivotally connected to the intermediate section r at 3 and to the car body at 4 and these are swung to a horizontal position *t'* when the roof is opened. A window *w* may be secured directly to the pillars *t*, or they may be carried by frames (not shown) attached to the pillars *t*.

It will be evident that in this embodiment, as with the preceding examples, the roof can be opened to the first position wherein the accommodation space is closed but accessible through the car doors *o* or by movement of the front roof section *i*, or to a second position wherein the accommodation space is open. In all cases, when the roof is in the first position the front edge of the front section lies in contact with or just above the backs of the front seats.

The roofs may be made of any convenient rigid material such as wood or metal or

synthetic materials, or combinations thereof may be employed.

One particular advantage of the construction is that it can be adapted for mechanical operation, for example by means of a lever and rod mechanism, manually operable from the driver's seat, or by a power drive. The weights of the various sections may be balanced by means of counterweights, springs or the like.

What I claim is:—

1. A rigid roof for a motor road vehicle of the type described comprising a plurality of sections a rear section of which is pivotally or foldably connected to the rear of the vehicle body, the remaining sections being pivotally or foldably connected to the body or to the rear section so that they can be lowered to a first position wherein they close the accommodation space behind the front seats of the vehicle and lie with the front edge of the roof in contact with or close to the backs of the front seats, or to a second position clear of the accommodation space.

2. A roof as claimed in claim 1 comprising two sections, namely the rear section and a front section, the front section being capable of being pushed to a position wherein it lies just above the rear section.

3. A roof as claimed in claim 2 wherein the rear section comprises side walls and a rear wall, the latter being hingedly arranged so that it can be folded to lie within the rear section when the roof is opened.

4. A roof as claimed in claim 1 wherein the roof comprises three sections, namely the rear section, a front section and an intermediate section, the rear section, including side and rear walls of the roof, being pivotally connected to the vehicle body and adapted, upon opening of the roof, to be received in the body behind the accommodation space.

5. A roof as claimed in claim 4 wherein the intermediate section is connected to the rear section so that when the roof is opened the intermediate section moves backwards and is lowered to a position above the rear section.

6. A roof as claimed in claim 5 wherein window pillars are provided on the vehicle body, being pivoted thereto and to the intermediate section.

7. A roof as claimed in claim 6 wherein the movements of the various sections are coupled so as to permit automatic operation thereof.

8. A rigid roof for a motor road vehicle substantially as hereinbefore described with reference to and as illustrated in Figs. 1 and 2, Figs. 3 and 4 or Figs. 5 and 6 of the accompanying drawings.

For the Applicant:
WILSON, GUNN & ELLIS,
Chartered Patent Agents,
57 Market Street, Manchester 1.

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756,531 COMPLETE SPECIFICATION
1 SHEET

This drawing is a reproduction of the Original on a reduced scale.

Fig. 1

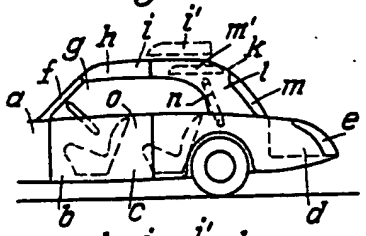
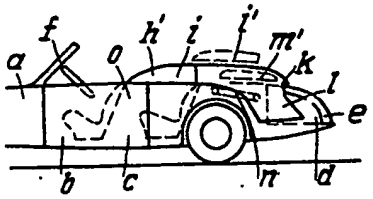



Fig. 2



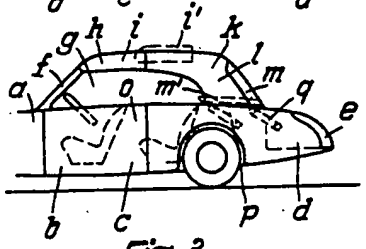




Fig. 3

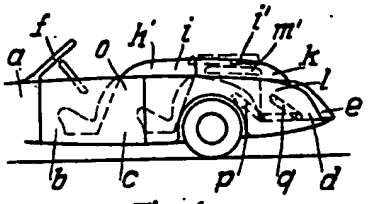



Fig. 4

Fig. 5

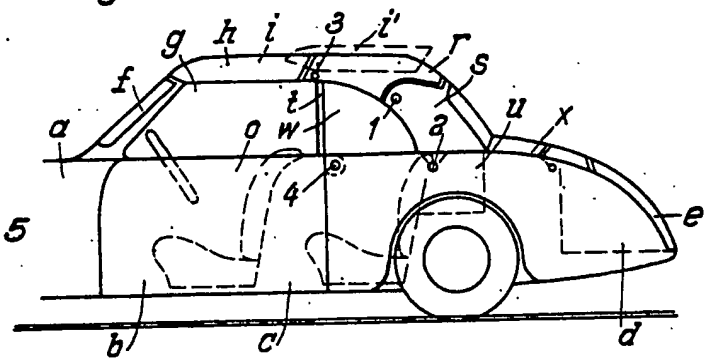



Fig. 6